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MIGRATION TRENDS OF OLDER AGED PERSONS IN MINNESOTA

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Presented the 19th of September 1969
by Reino Ajo and Stig Jaatinen

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ABSTRACT

The study focuses upon the migration of older aged persons (over 50 years of age) in Minnesota between the years of 1950 and 1960. A basic hypothesis is formulated which contends that there is a threshold age after which the migration patterns of older aged cohorts begin to differ from more general migration trends. By using the census survival rate as an indirect measure of migration, it is shown that the threshold occurs at a time when the majority of people retire from the active labor force. The residuals from the state average are also mapped so as to determine where the migration flows of older aged people are directed within the state.

INTRODUCTION

The starting point for this paper has been provided by a previous study of the authors which focused upon age group and cohort changes within a rural-urban continuum (Rikkinen and Alanen 1969). When an analysis was made of the relationship between the growth of age groups and distance from Duluth, Minnesota, it was determined that the correlation, in most cases, was negative. As a rule, the slope (beta) values which were derived for the different age groups during the 1950—1960 interim displayed a decline with increasing age (Fig. 1). However, the oldest age group analyzed (65 years of age and over) differed from all of the other groups in that the senior citizens showed a positive, albeit weak, distance-population change correlation. The study served to formulate a hypothesis which contended that whereas »younger old people» follow general rural-urban migration trends, there is a certain threshold age after which other migration rules begin to be followed.

At the same time, another recent study, which analyzed the migration flows between different metropolitan areas of California, reached a somewhat different conclusion: »The mean first passage times for the 20—24 and 65—69 age groups differ considerably in absolute values but are

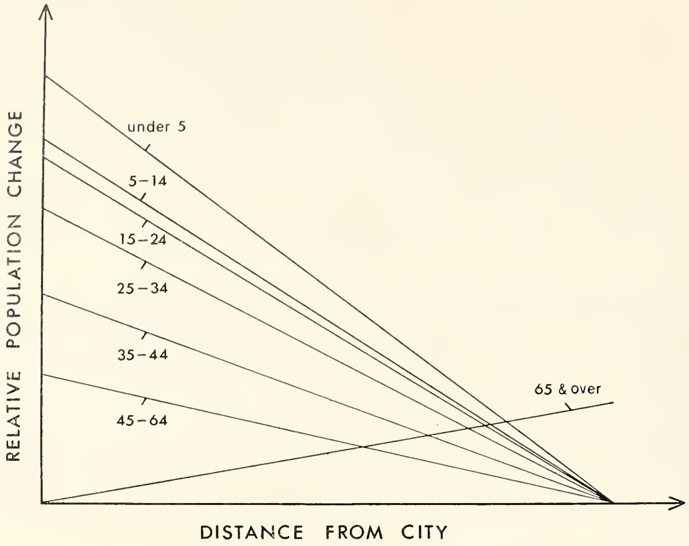

Fig. 1. Relationship between distance from Duluth and population change of different age groups: 1950—1960 (after Rikkinen and Alanen 1969, Table 1).

very similar in relative terms. This is an indication that, although the former age group is much more mobile than the latter age group, their movement patterns are quite similar» (Rogers 1968, p. 101).

Since it appears, at first glance, that the two hypotheses are in conflict, there is ample reason to analyze the migration trends of older aged persons at greater length. This paper will, therefore, be concerned with the migration of persons over fifty of age and the relationship of their movement patterns to general migration trends. The state of Minnesota serves as the study area with county level data being employed to make the basic analysis. County figures have been used since the county is the smallest unit of measurement for which adequate age-sex structure data are available. The study period comprises the 1950—1960 census interim.

DATA AND METHOD

Since the official census publications of the United States do not provide direct total migration data for counties and smaller areas —

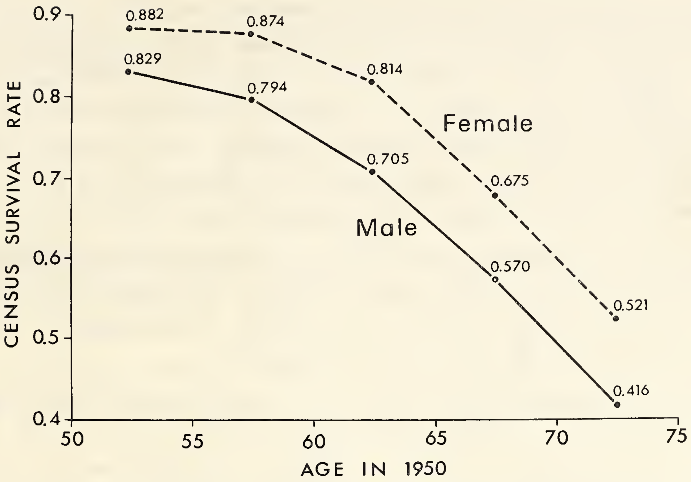

Fig. 2. Census survival rates for older aged persons in Minnesota: 1950—1960.

much less for individual components of the population — it has been necessary to employ an indirect method for determining migration. This technique, based upon age-sex specific information for 1950 and 1960 (U.S. Bureau of the Census 1952, 1963), is commonly referred to as the *survival rate method.* The data, which have been placed into five year groupings, will be studied in terms of five cohorts for the 1950—1960 census period. The letters A-E will be used throughout the study to signify the different cohorts.

A. 50—54 to 60—64
B. 55—59 to 65—69
C. 60—64 to 70—74
D. 65—69 to 75—79
E. 70—74 to 80—84

Total population change between 1950 and 1960 was the result of two factors: net-migration and mortality. If the mortality or survival rate for a cohort can be estimated, it is then possible to determine the estimated net-migration for the cohort by 1) taking the product of the 1950 population times the survival rate and 2) subtracting this figure from the 1960 cohort population (1960—1950 × S. R.).

The rationale for the survival rate method, as well as the problems which arise when using it, have been discussed quite recently by several authors (compare, for example: Price 1955, Isard 1960, Tarver 1962, Hamilton 1966, 1967). Since it is obvious that there is no practical way of determining the exact county survival rate for every cohort or for males and females separately, the study presented herein will utilize an indirect measure, namely, the census survival rate.

The census survival rate, as such, is the ratio of the population in a given cohort at the end of the period (1960) to the population in the same cohort at the beginning of the period (1950). The change in this ratio is displayed by age and sex groups in Figure 2.

The diagram reveals that the survival rate decreases quite regularly with increasing age. This, of course, reflects the natural rise in mortality over the life span of any cohort. The difference in the male and female cohorts illustrates the general tendency of women to live longer than men.

Even though the »true» survival rates are not known, the census survival rate can be used to give a rough picture of net cohort migration at the county level — if an initial assumption is made which contends that the survival rate does not vary from one county to another when the same age-sex specific cohort is being considered. When the survival rate is constant, the census survival rate gives an indication of net-migration. At the same time, this study also recognizes the limitations of the census survival rate method in that the »real» age-sex specific survival rates vary somewhat from county to county — especially when the older cohorts are being considered. Likewise, the possibility of error which arises when estimating migration rates also increases with age (Price 1955, p. 183). These factors always have to be considered when conducting an analysis such as this.

MIGRATION TRENDS IN DIFFERENT AGE-SEX SPECIFIC COHORTS

Figures 3—8 portray the individual county census survival rates for males and females. The counties have been ranked in terms of relative population change, as determined by the census survival rate for the total county population. Such an approach makes the comparison

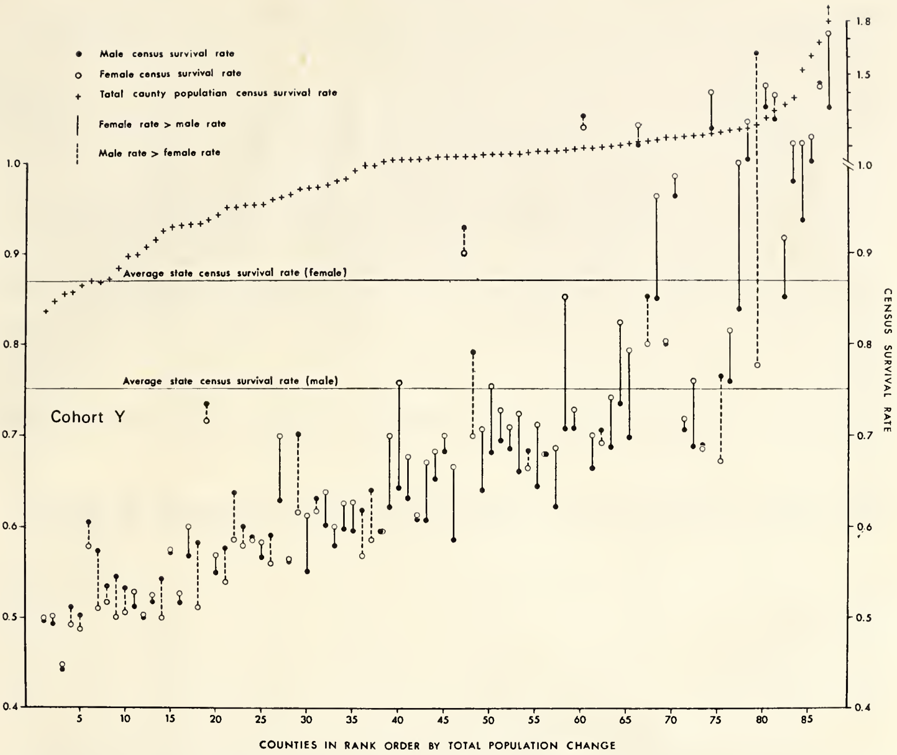

Fig. 3. Census survival rates for cohort Y, by county.

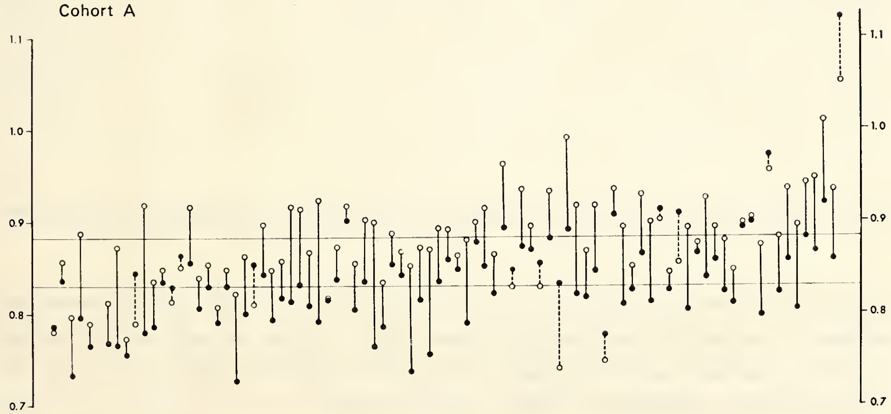

Fig. 4. Census survival rates for cohort A, by county. See legend in Figure 3.

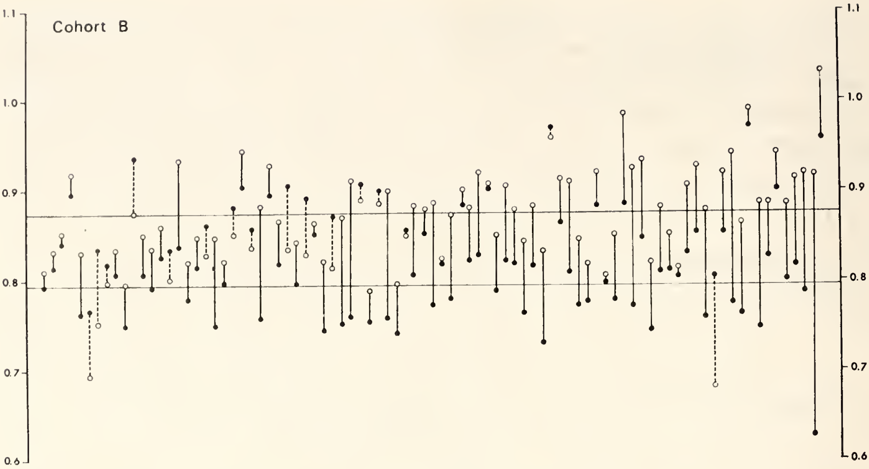

Fig. 5. Census survival rates for cohort B, by county. See legend in Figure 3.

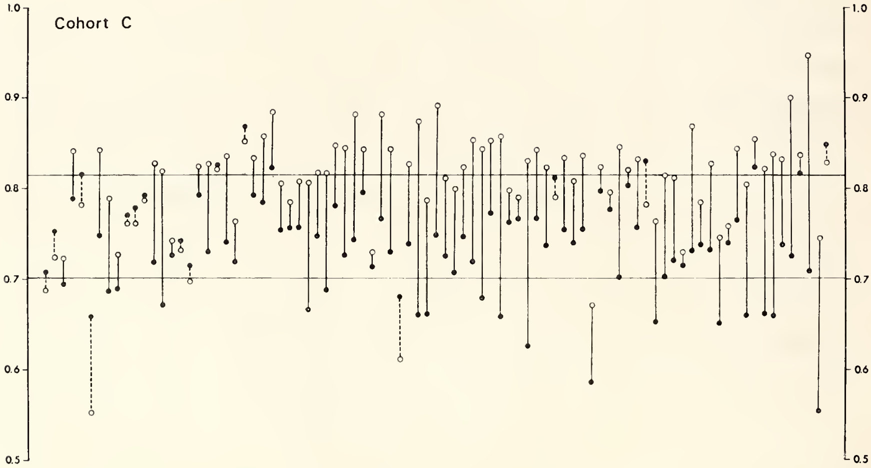

Fig. 6. Census survival rates for cohort C, by county. See legend in Figure 3.

between »general» migration trends and the migration of persons in different cohorts considerably easier. To a fair extent, the position of the counties in the rank order also reflects their rural-urban characteristics (Rikkinen 1969, pp. 12—14).

For purposes of comparison with the oldest cohorts (A—E), the

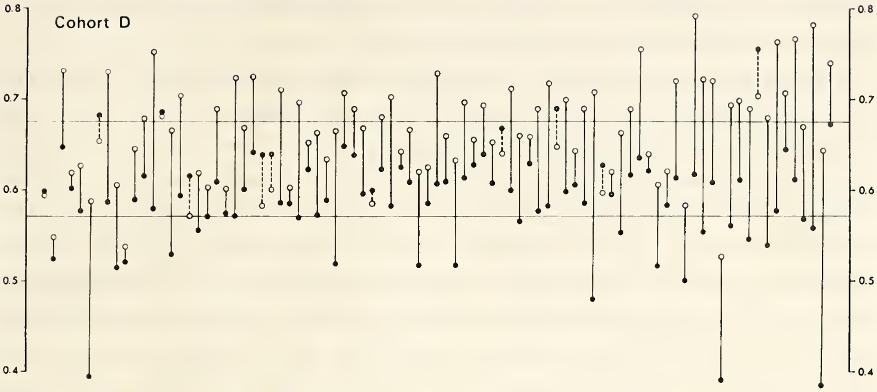

Fig. 7. Census survival rates for cohort D, by county. See legend in Figure 3.

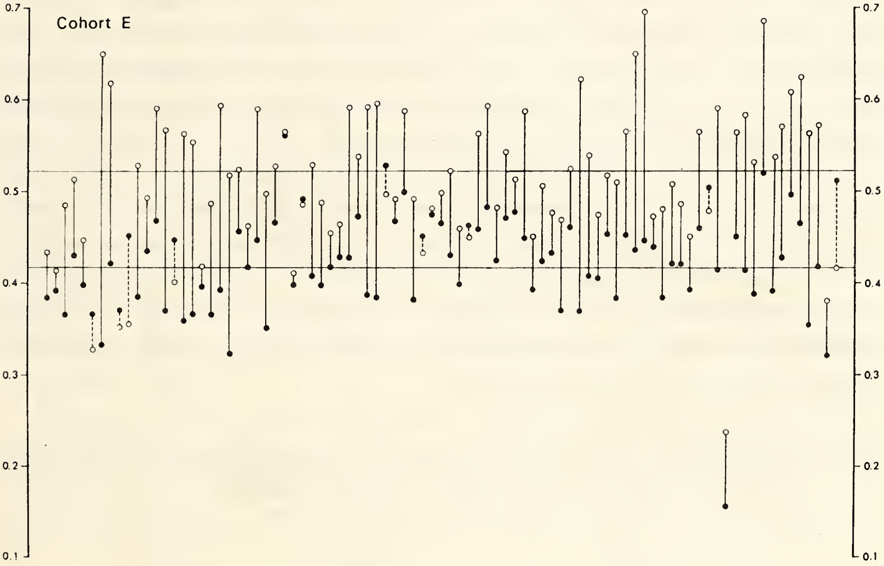

Fig. 8. Census survival rates for cohort E, by county. See legend in Figure 3.

diagram (Fig. 3) depicts the survival rate for one younger cohort (Y). Cohort Y, in this instance, refers to those people who were between the ages of 5—14 to 15—24 during the 1950—60 census interim. With the county rank order determined by the rate of total population change between 1950 and 1960, it is possible to see that there is a noticeable population decline in the first group of counties while the latter group reveals a very strong increase.

Figure 3 shows that the male and female survival rates for cohort Y and the county population survival rate are strongly correlated. The correlation coefficients (Table 1) also exhibit the same tendency — even though a linear correlation provides only a rough measure in this instance. The high correlation is quite easy to understand since the younger working force, society's most migration-prone age group, strongly influences the total migration figures. The net-migration activity of young males, which does not follow the total migration trends as closely as the young females, is probably due to many reasons: the large number of males engaged in military duty outside of the state, the differential attraction to economic opportunities, a difference in the number of out-of-state students, and so forth.

When compared to cohort Y, cohort A displays a smaller survival rate deviation (Fig. 4); however, it can still be seen that the rate increases with the average rank order position. The positive correlation between the total population rate and the cohort rate is still highly significant for both men and women (Table 1). In addition, the coefficient of correlation between cohorts Y and A is statistically significant at the 0.1 % level for both males (r = .449) and females (r = .496). Thus, the migration of cohort A follows the same general trends which the younger work force displayed. On the other hand, one noticeable difference is evident: the migration displayed by these »younger old people» in absolute terms is considerably under that of the youngest members of the labor force.

Table 1. Coefficients of correlation between total relative population change and census survival rate in different cohorts.

Cohort	Male	Female
Y (5—14 to 15—24)	0.712***	0.815***
A (50—54 to 60—64)	0.677***	0.599***
B (55—59 to 65—69)	0.015	0.485***
C (60—64 to 70—74)	—0.045	0.266*
D (65—69 to 75—79)	—0.056	0.356**
E (70—74 to 80—84)	0.107	0.036

*** Significant at the 0.1 % level.
** Significant at the 1 % level.
* Significant at the 5 % level.

When analyzing the older cohorts (B-E), it is difficult to discern such a clear correlation between the census survival rate and the county rank order (Figs. 5—8). Several cohort rates vary quite irregularly along either side of the line which depicts the average state survival rate. This is also noticeable when viewing the correlation coefficients in Table 1. A very clear threshold between the males in cohorts A and B is evident; the former displays a highly significant correlation coefficient ($r = .677$) while the latter approaches zero ($r = .015$). The female cohorts, meanwhile, display a more gradual decrease, probably because the women are usually younger than their mates and also, the moves of women near the age of retirement are clearly linked to the retirement of their husbands. In addition, since married women generally outlive their spouses, they might display particular movement patterns rather late in life.

When the survival rates of the oldest aged cohorts are considered, it is not possible to derive any very detailed conclusions about migration since these cohorts are so greatly affected by mortality. Nevertheless, the migration displayed by the persons in the oldest cohorts is quite small. Another indication of increased mortality is the decreasing correlation between the census survival rates for men and women with increasing age (Table 2). The decreasing correlation is not only due to age, but especially to differences in male and female survival rates. For example, when the oldest cohorts are considered, the survival rates for the males in cohort D and the females in cohort E are closely correlated ($r = .638$). This, again, reflects the greater average life expectancy of any female cohort.

When all factors are considered, the hypothesis presented at the beginning of the paper appears to be true: the migration of older aged persons does not follow general rural-urban migration trends. An evident »threshold» occurs between cohorts A and B since, during this

Table 2. Coefficients of correlation between the census survival rates for males and females in different cohorts.

Y	0.817***
A	0.671***
B	0.409***
C	0.333**
D	0.321**
E	0.336**

*** Significant at the 0.1 % level.
** Significant at the 1 % level.

interim, most people retire from the active labor force.[1] It is also interesting, once again, to compare the hypothesis of this paper to that of the previously-mentioned California study which stated that the relative migration activity of young adults and older persons is quite similar. Even though the two studies give different results, they are not in conflict. One basically measures rural-to-urban migration trends within a moderately growing midwestern state, while the other focuses upon inter-urban migration patterns within the most populated state of the nation. It is entirely possible that the older persons in California, like many other residents of the state, demonstrate a greater-than-average proclivity to migrate. The migration patterns of urban-oriented Californians would almost certainly differ from that of the more rural and less metropolitan-oriented Minnesotans. Thus, the two seemingly different results really serve to illustrate the complexity of the United States' migration phenomenon.

THE MAPPING OF RESIDUALS

Although it is not the major purpose of this paper, the following section will be concerned with the question of why some areas experience migration gains and others display losses. The methodology employed, as well as the data limitations, make it possible only to present certain assumptions; while it is possible to estimate net-migration, the actual origins of the in-migrants and the destinations of the out-migrants are unknown (Isard 1960, p. 56).

It would appear, nonetheless, that certain conditions, such as the existence of high amenity features, must play a significant role in attracting recently retired persons to some counties. In an effort to determine this, residual maps have been prepared which show individual county census survival rates for all cohorts. The residuals, for both males and females, have been determined by the percentage deviation from the state average. As an example, Figure 9 presents the residuals for four male cohorts (A, B, D, E). The female cohorts display about the same variations as the male cohorts.

By viewing cohort A it can be seen that the counties experiencing

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[1] Although the age of retirement is not a completely uniform occurrence, it can be assumed that the majority of people, during 1960, retired at the age of 65.

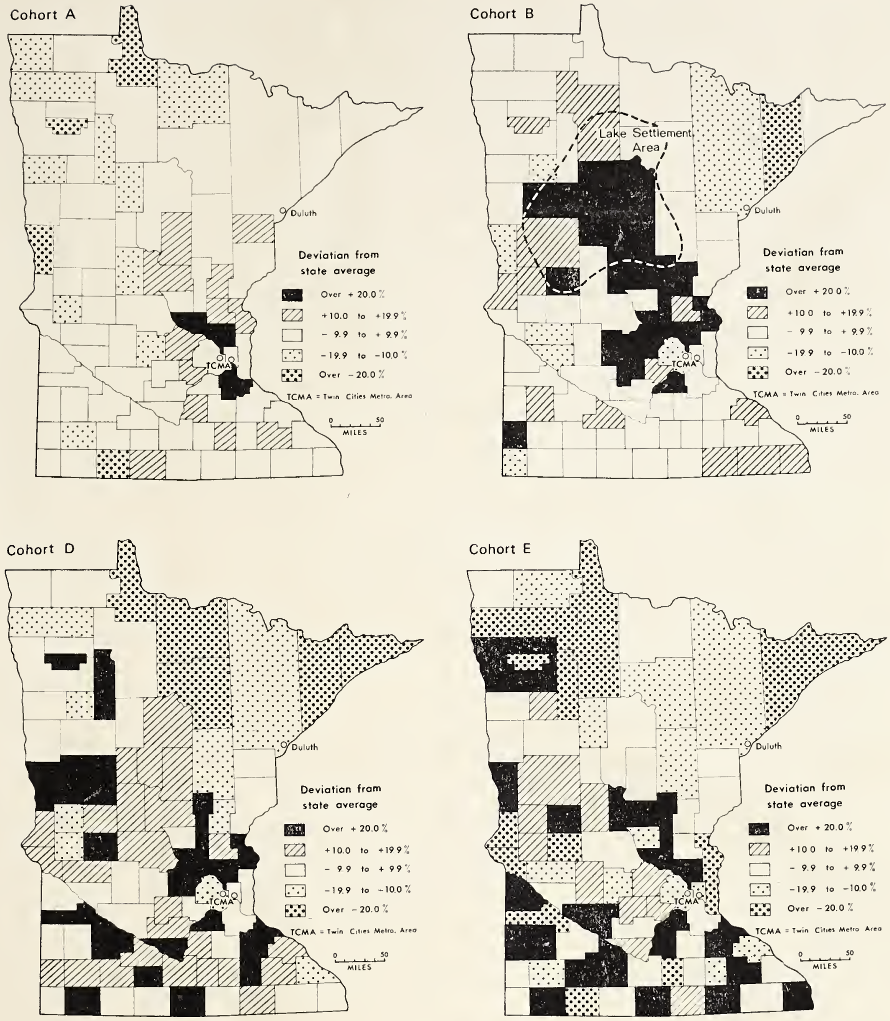

Fig. 9. Residuals from state average census survival rate for male cohorts A, B, D and E, by county.

net-immigration gains were concentrated in the major suburban parts of the Twin Cities Metropolitan Area and within those areas influenced by certain other large cities such as Duluth. The counties displaying the greatest net-emigration were located in northern Minnesota's declining rural areas. The residual maps indicate that cohort A exhibits the same tendencies which have generally been associated with rural-urban migration flows in Minnesota (Adams 1964, p. 27).

When the persons who have just retired are analyzed (cohort B), the pattern of net-migration activity changes somewhat. Whereas metropolitan counties with the greatest suburban population continued to gain, several counties further to the northwest of the Twin Cities also experienced migration increases. This latter area, the so-called »Lake District» or »Big Moraine» region of Minnesota, is noted for its multitude of lakes, rolling and wooded hills and general vacation-oriented characteristics. While the attractiveness of the region has served to provide the impetus for increased tourist activity and a growing number of part-time residents, another most notable occurrence has involved the influx of older people who partake of the region's amenities throughout the year. The attractiveness of this area, especially for retired persons, has also been noted by Borchert *et al.* (1964, pp. 12—13).

The residual maps for the oldest cohorts (D and E) do not form such a compact pattern. The movement to new homes or new areas which was so noticeably displayed by those persons who had just retired (cohort B), declines significantly when the »older old people» are considered. The residual figures for the oldest cohorts probably show the existence of nursing and boarding care facilities and related regional mortality differences.

The residual maps indicate that when older aged persons are considered, their general migration flows begin to differ from the movement patterns of younger people in a progressive step-by-step manner.

CONCLUDING REMARKS

Since direct data are not available for determining migration activity, this study has utilized the more indirect census survival rate method as a migration measure. In using this method, however, it has not been possible to make a detailed analysis of the situation; it has only been possible to operate within the basic dimensions or constraints of older aged cohort migration.

Because of the limitations, most of the conclusions had to be made rather carefully. However, even while operating within such constraints, certain points were revealed. The most noticeable of these was the obvious threshold between the migration patterns of just-retired persons and those of the general population. This was especially true of the male cohorts. It was also evident that for people in their initial retirement years, the usual significance of the work-home bond declines and is replaced by the amenity-home relationship. When proceeding further along the age spectrum, the existence of home, care and hospital facilities begins to play an increasingly important role in regulating any migration activity. Above all, the study serves to reveal that while the migration of older people to and within California and other warm weather states is a commonly recognized occurrence, intra-state migration, even within a state outside one of the more »popular» retirement areas of the United States, is no less complex, varied or multifaceted.

REFERENCES

Adams, Russell B. (1964). Population mobility in the Upper Midwest. *Upper Midwest Economic Study, Urban Report* 6, 1—60.

Borchert, John R., Anding, Thomas L. and Gildemeister, Morris (1964). Urban dispersal in the Upper Midwest. *Upper Midwest Economic Study, Urban Report* 7, 1—24.

Hamilton, C. Horace (1966). Effect of census errors on the measurement of net migration. *Demography* 3, 393—415.

— » — (1967). The vital statistics method of estimating net migration by age cohorts. *Demography* 4, 464—478.

Hamilton, C. Horace and Henderson F. M. (1944). Use of the survival rate method in measuring net migration. *Journal of the American Statistical Association* 39, 197—206.

Isard, Walter (1960). *Methods of regional analysis: an introduction to regional science.* 784 p. New York.

Price, D. O. (1955). Examination of two sources of error in the estimation of net internal migration. *Journal of the American Statistical Association* 50, 689—700.

Rikkinen, Kalevi (1969). The net-migration of young people in Minnesota: 1950—1960. *Annales Academiae Scientiarum Fennicae* A. III. 101, 1—24.

Rikkinen, Kalevi and Alanen, Arnold (1969). Changing age structure in a rural-urban continuum. *Geografiska Annaler,* Ser. B, 2, 57—71.

Rogers, Andrei (1968). *Matrix analysis of interregional population growth and distribution.* 119 p. London.

Tarver, James D. (1962). Evaluation of census survival rates in estimating intercensal state migration. *Journal of the American Statistical Association* 57, 841—862.

U. S. Bureau of the Census (1952). *U. S. census of population: 1950,* Vol. II, Characteristics of the population, Part 23, Minnesota, Washington D. C.

— » — (1963) *U. S. census of population: 1960,* Vol. I, Characteristics of the population, Part 25. Minnesota, Washington D. C.

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